

**APPENDIX F: IMPACT ASSESSMENT FOR THE PROPOSED REALIGNMENT OF
A SECTION OF THE MN73 TO ACCOMMODATE SOLAR ENERGY FACILITIES NEAR
PAULPUTS SUBSTATION, NORTHERN CAPE.**

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INTRODUCTION

The area immediately surrounding the Paulputs Substation (located approximately 45km north-east of Pofadder), and specifically Portion 4 of the Farm Scuitklip 92 has become a node for solar energy facility developments. Two Concentrated Solar Power (CSP) facilities and one photovoltaic (PV) facility have already been constructed in this area. These are known as the Kaxu Solar One, Xina Solar One and Konkoonsies I PV plants respectively. Another PV facility (known as Konkoonsies II PV) is to be constructed during 2017, and a third CSP facility (known as the Paulputs CSP project) received an environmental authorisation on 16 November 2016.

The development of the solar energy facilities are in response to the requirement for additional electricity generation capacity at a national level and in response to identified objectives of the national, provincial, local and district municipalities to develop renewable energy facilities. In order to facilitate the construction of the Paulputs CSP Facility, the Northern Cape Department of Roads and Public Works (NC DR&PW) propose that a section of the MN73 road traversing Portion 4 of the Farm Scuitklip 92 is realigned.

The MN73 realignment is proposed in order to accommodate the Paulputs CSP Facility while ensuring safe road use for the surrounding landowners currently utilising the MN73. The realignment of the road will entail:

- » the construction of a new section of road ~4km in length and ~7m wide (with a road reserve of 20m) according to approved Northern Cape Department of Roads and Public Works (NC DR&PW) plans and standards ; and
- » the decommissioning of ~3km of the existing MN73 road as and where required after commissioning the realigned section. Portions of the decommissioned section of the MN73 road will not be rehabilitated where these are used to provide internal access for the Paulputs CSP Facility.

The Northern Cape Department of Roads and Public Works (NC DR&PW) will be responsible for operation and maintenance of the road.

The newly construction road will be a single carriageway gravel road, 7m wide within a road reserve of 20m. The development of stormwater control management systems will divert water from the construction areas and will also be applicable during the operation phase of the road. A 40m corridor was investigated for the Project to allow for optimisation of the infrastructure layout in order to, inter alia, accommodate specialist findings where necessary. The final placement of the realignment will depend on local geotechnical, topographical conditions and potential environmental sensitivities.

The 40m corridor for the proposed realignment will start approximately 600m north of the Paulputs Substation in the southern portion of the project site adjacent to the heliostat field and associated infrastructure of the authorised Paulputs CSP Facility. The realignment will follow the boundary of the heliostat field and intersect the existing R357 (also known as the Onseepkans road) on the northern boundary of Portion 4 of the Farm Scuitklip 92, at a point approximately 370m north east from the current intersection. The length of the realigned section of road is approximately 4km.

The following criteria were considered within the assessment of potential environmental impacts associated with this proposed project:

- » The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
- » The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high).
- » The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4; or;
 - * Permanent - assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- » The **status**, which is described as positive, negative or neutral.

- » The degree to which the impact can be reversed.
- » The degree to which the impact may cause irreplaceable loss of resources.
- » The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

$S = (E+D+M) P$; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance** weightings for each potential impact are as follows:

- » **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- » **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

The sections below provide an impact assessment of the realignment, as follows:

- » Section A: Impacts associated with the proposed realignment of the MN73.
- » Section B: Assessment of Cumulative Impacts
- » Section C: Overall Conclusions

SECTION A: IMPACTS ASSOCIATED WITH THE PROPOSED REALIGNMENT OF THE MN73

The specialist studies undertaken have considered the 40m corridor which has been provided by the developer for the siting of the realigned road. The results of the impact assessment of the corridor indicated that the corridor is feasible, appropriate and avoids adverse environmental impacts such as the no-go areas. Therefore, the 40m corridor proposed in Portion 4 of the Farm Scuitklip 92 for the road realignment is considered as the *least intrusive* on the environment and most suitable.

1. Assessment of Potential Impacts on Ecology

The project site¹ falls within the Karoo Biome and within the Bushmanland Arid Grassland. The Bushmanland Arid Grassland is considered to be least threatened and is characterised by extensive to irregular plains on a slightly sloping plateau sparsely vegetated by grassland dominated by white grasses (*Stipagrostis* species) giving this vegetation type the character of semi-desert 'steppe'. In places, low shrubs of *Salsola* change the vegetation structure. In years of abundant rainfall, rich displays of annual herbs can be expected (Mucina & Rutherford, 2006).

A total of 13 plant species of conservation concern were determined to possibly be occurring in Portion 4 of the Farm Scuitklip 92. Of these, there were five species that could occur in habitats that are available in the project site. Two of these are listed as Vulnerable, one as Near Threatened and two as Declining. One of the vulnerable species, *Aloe dichotoma*, was recorded in the eastern portion of the project site. The one Declining species, *Acacia erioloba*, also a protected tree, has a high probability of occurring in Portion 4 of the Farm Scuitklip 92, while *Hoodia gordonii* was recorded in the project site in a number of places but not within the 40m assessment corridor. One protected plant species has been recorded within the 40m assessment corridor and include *Boscia foetida*. Protected plants identified within the development footprint will not be disturbed or removed prior to a relevant permit being granted.

Herpetofauna diversity is generally low in the project site as can be expected in arid areas with approximately 45 reptile species occurring in the area. Ten species were confirmed during the site surveys. No exotic herpetofauna species are expected to occur on the project site. Two of the species recorded, namely *Naja nivea* and *Cordylus polyzous*, are considered endemic to southern Africa. It was noted that there is a high similarity between the species occurring in the different vegetation communities. Most of the expected species in the area are common and widespread, with only the Black-

¹ The project site is defined as Portion 4 of the Farm Scuitklip 92, which has a total extent of ~3518ha.

necked spitting Cobra (*Naja nigricollis*) being classified as rare. No amphibian species were recorded.

Of the 67 mammal species expected to occur in the study area² 16 were confirmed during two site visits conducted from 4 – 14 August 2015 and 5 – 13 April 2016 respectively. Mammal diversity is low as can be expected in arid areas. There is a high similarity between the species occurring in the different vegetation communities. A number of bat species are known to occur in the region. Bat species recorded in the area during the surveys are *Rhinolophus darlingi*, *Neoromicia capensis*, *Pipistrellus rueppelli* and *Tadarida aegyptiaca*.

The ecological function of the study area can generally be described as moderate for the majority of the study area, although this does vary from low (in the highly transformed areas) to high in the more inaccessible or unutilisable areas. Areas in which overgrazing and clearing have previously taken place.

Areas that have been severely disturbed such as settlements are considered of low conservation importance. In the study area, the edge effect of the farmer's homestead has an effect on small parts of the study area as well as roads that are a result of human settlement. These areas are, however, quite small in relation to Portion 4 of the Farm Scuitklip 92 (<30% of the project site). Areas that have been disturbed by farming are considered of moderate conservation importance due to the fact that rehabilitation of these areas is possible (refer to **Figure 1.1**). The impacts of farming in this area is mostly overgrazing as well as denudation of some areas around watering holes and roads. Another impact of farming is the introduction of exotic species. Feed imported during droughts contains seed or parts of exotic species that make their way into the natural systems where they germinate and spread. This is particularly evident in the drainage line to the north of the project site. The natural areas are considered of very high conservation importance due to the presence of Red Data species in these areas. No natural areas have been identified within the proposed 40m corridor.

The impact assessment determined that the following impacts are likely to occur due to the development during the construction phase, namely:

- » Clearing of vegetation and subsequent loss of species of concern;
- » Spillage of harmful or toxic substances;
- » Disturbance of biodiversity due to vibration and noise;
- » Habitat degradation and fauna impacts due to dust;
- » Effects on local migrations;
- » Increased prevalence of exotic invasive species; and

² The study area is defined as the area west of the section of the MN73 to be decommissioned and north of the existing Paulputs/Scuitdrift 1 132kV and Paulputs/KaXu Solar 1 132kV power lines and includes the 40m corridor.

» Increased soil erosion.

The only possible ecological impacts associated with the road during the operation phase may be due to road maintenance, and these will need to be addressed by the NC DR&PW before such maintenance is implemented.

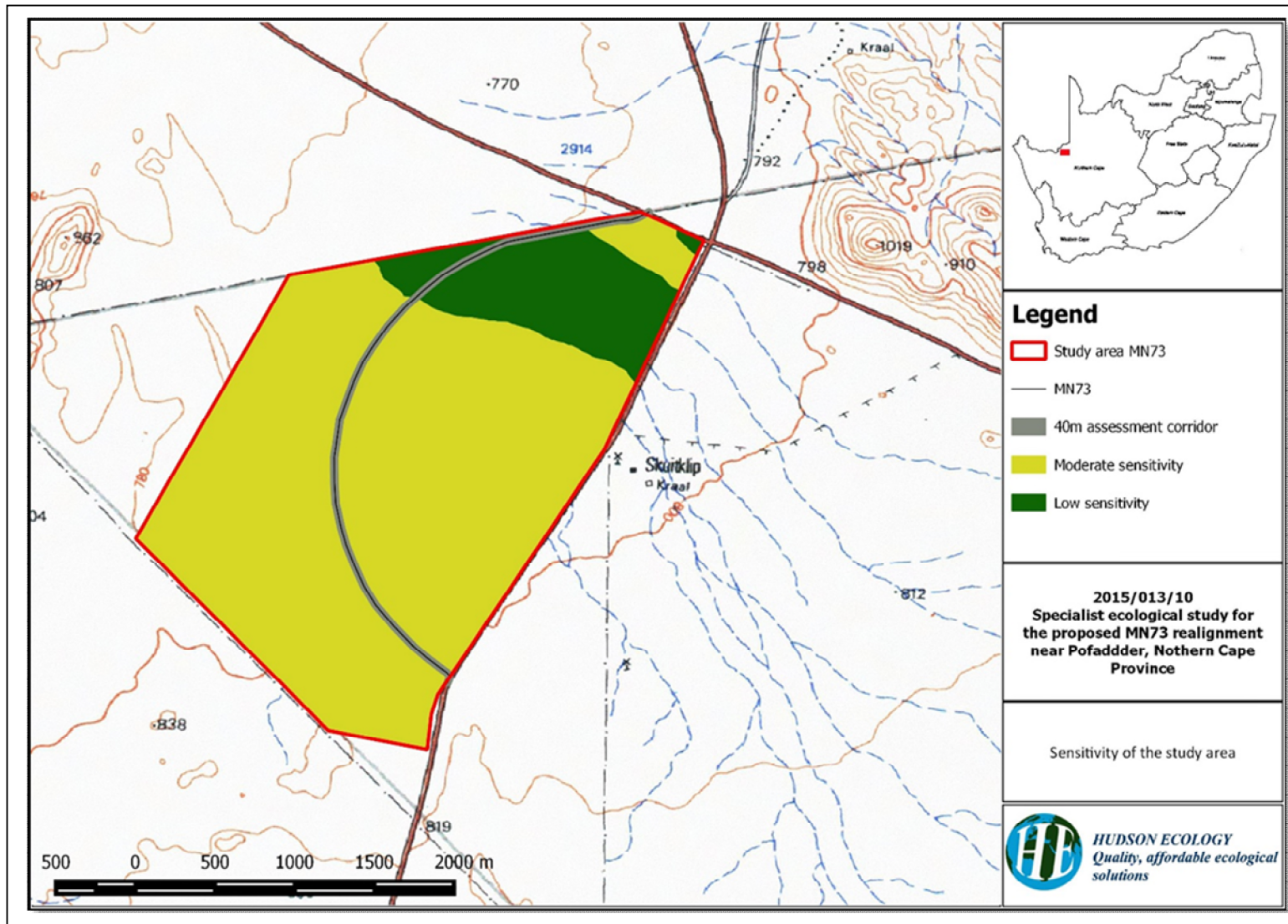


Figure 1.1: Ecological sensitivity map of the study area within Portion 4 of the Farm Scuitklip 92.

1.1. Construction Phase

This phase assesses the impacts associated with the study area and 40m assessment corridor for the MN73 realignment.

Construction Impact 1: Potential Impacts due to the clearance of vegetation and loss of species of concern

<p>Nature: Vegetation clearing is likely to be the greatest impact on the vegetation communities affected by the proposed road realignment. All three vegetation communities are likely to be affected to some degree, with the <i>Acacia mellifera - Aristida congesta</i> Open Shrubland vegetation community being the vegetation community with the most vegetation cleared.</p> <p>Ecological integrity and -conservation importance of the areas that will be affected by this impact are low to moderate, however species of concern (such as <i>Hoodia gordonii</i> and <i>Boscia foetida</i>) may be impacted upon.</p>		
	Without mitigation	With mitigation
Extent	Site Only (1)	Site Only (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Minor (2)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (40)	Low (28)
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources	Yes	Yes
Can impacts be mitigated	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Vegetation clearing is inevitable and unavoidable. Mitigation of this impact can, however, be implemented by keeping the area cleared to a minimum and careful removal and replanting of plants and trees of conservation importance. Seed collection, propagation and replanting of saplings to make up for lost species should also be considered. » Areas of high conservation importance and/or ecological integrity should be avoided if possible, or kept to a minimum and any species of concern relocated, or demarcated to prevent destruction, before the ground clearing begins. » Ground clearing should take place at the beginning of winter in order to minimise impacts on young of burrowing animals and nesting birds. » The impact of vegetation clearing is likely to be permanent, but through careful planning, monitoring enforcement of the EMP and rehabilitation, the impact can be greatly reduced. Topsoil conservation is an integral part of rehabilitation efforts and helps to maintain the productive capability and ecological functionality of rangelands. Topsoil should be stockpiled for revegetation once construction is completed. Search and rescue of species of concern should take place before ground clearing. 		
<p>Cumulative impacts:</p> <p>The significance of cumulative impacts are considered to be of low significance. Due to the fact that the Project will serve as the realignment of an existing road, there are unlikely to be increased cumulative impacts.</p>		
<p>Residual impacts:</p> <p>There would be a localised loss of vegetation.</p>		

Construction Impact 2: Potential Impacts due to spillage of harmful or toxic substances

Nature: Harmful or toxic substances that may affect the biota of the area if they were to enter the system include: diesel, hypoid oil, motor oil, polluted water used during the construction of the road and chemicals transported to and from site. Habitats affected are mainly those with moderate ecological integrity and moderate conservation importance. The spillage of harmful or toxic substances may impact on the fauna and flora of the area in a number of ways.

Direct pathways include ingestion of the substances by fauna species resulting in toxicity in that individual, uptake of toxic chemicals by the roots plants which may lead to toxicity in the plants and the chemicals entering the plant or animals system due to contact (through the skin, leaves or stems). Indirect pathways include the ingestion of contaminated plants or animals by other herbivorous or predatory species. The predation of contaminated animals by both other animals and humans is a common occurrence during chemical contamination due to these animals being sluggish, and less likely to escape predation, due to chemical toxicity.

Impacts on high ecological integrity and ecological conservation importance areas are low to moderate, however species of concern (such as *Hoodia gordonii* and *Boscia foetida*) may be impacted upon.

	Without mitigation	With mitigation
Extent	Local (2)	Site Only (1)
Duration	Long Term (4)	Very Short (1)
Magnitude	High (8)	Low (4)
Probability	Highly Probable (4)	Very Improbable (1)
Significance	Moderate (56)	Low (6)
Status	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources	Yes	No
Can impacts be mitigated	Yes	

Mitigation:

The spillage of harmful or toxic substances can be mitigated by the implementation of best practice management measures for the storage and handling of all hazardous substances as well as through the implementation of a sound emergency spillage containment plan, which can be implemented as soon as a spill of harmful or toxic substances occurs.

Cumulative impacts:

The significance of cumulative impacts are considered to be of low significance, short in duration and confined to the site only.

Residual impacts:

There would be a localised loss of species.

Construction Impact 3: The potential disturbance of biodiversity due to vibration and noise

Nature: Vibration and noise will have a significant effect mainly on fauna species in the immediate vicinity of the development, due to the heavy machinery utilised. Vibration can affect a number of subterranean fauna taxa, such as burrowing mammals, reptiles and arthropods. Vibration affects these animals by causing the collapsing of burrows, and causing these animals

to leave the area due to the vibration. Noise will also affect a wide range of taxa including avifauna, mammals, reptiles, amphibians and arthropods. Avifauna, especially songbirds, and amphibians may find it difficult to find mates in areas of increased noise. Mammals, reptiles and arthropods may find increased noise disturbing and therefore move away from the area. Areas of high conservation importance and/or ecological integrity should be avoided.		
	Without mitigation	With mitigation
Extent	Local (2)	Site Only (1)
Duration	Short Term (2)	Short Term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Definite (5)	Highly Probable (4)
Significance	Moderate (50)	Low (28)
Status	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources	Yes	Yes
Can impacts be mitigated	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Vibration and noise from heavy machinery can be kept to a minimum by reducing the movement of heavy vehicles to a minimum necessary for construction. » Placing the vehicle yard as close to the construction area as possible will also reduce the scale of impact of vibration. 		
Cumulative impacts:		
The significance of cumulative impacts are considered to be of low significance, short in duration and confined to the site only.		
Residual impacts:		
There would be a localised loss of species.		

Construction Impact 4: *The potential impact of habitat degradation and fauna impacts due to dust*

Nature: Increased dust will occur in all areas where vegetation is cleared. Dust will be caused by excavation, and construction. Dust in the area will be greatly increased due to the dry weather conditions and the nature of the soil in the area. Dust settling on plant material can reduce the amount of light reaching the chlorophyll in the leaves, thereby reducing photosynthesis, which in turn reduces plant productivity, growth and recruitment.		
	Without mitigation	With mitigation
Extent	Local (2)	Site Only (1)
Duration	Short Term (2)	Short (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Definite (5)	Improbable (2)
Significance	Moderate (50)	Low (18)
Status	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources	Yes	Yes
Can impacts be mitigated	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Dust suppression on roads by water bowsers or the use of other appropriate dust suppressants, if no water is available; 		

- » Exposed excavations, disturbed ground surfaces, and unpaved traffic areas can be maintained in a moist condition;
- » During non-working hours in the construction phase, the site can be left in a condition that will prevent dust from being generated;
- » Provide temporary cover and daily maintenance for soil stockpiles and keep active surfaces moist;
- » Construction activities should be conducted using methods that minimise dust generation.
- » Best Management Practices (BMPs) can also be followed to help minimise and control dust emissions at the site, during construction of the road.

Cumulative impacts:

The significance of cumulative impacts are considered to be of low significance, short in duration and confined to the site only.

Residual impacts:

There would be a localised loss of species.

Construction Impact 5: The potential effects on local migrations

Nature: Local migrations of fauna in the area may be affected by linear infrastructure, due to these areas forming a barrier to migrating animals or reducing the chance of an animal surviving its migration due to collisions with vehicles on roads. Desert animals are particularly migratory due to variations in food and water availability, and species of concern may be affected by this impact. This impact is likely to be low due to the greatly reduced wildlife in the area due to previous disturbances in the area causing a greatly reduced species. The study area is recognised as an ESA due to being a migratory route, this requires further monitoring during construction, with regards to types of species using the migration route and the effects on these species.

	Without mitigation	With mitigation
Extent	Local (2)	Site Only (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Highly Probable (4)	Improbable (2)
Significance	Moderate (52)	Low (20)
Status	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources	Yes	Yes
Can impacts be mitigated	Yes	

Mitigation:

- » The effect of roads on local migrations can be mitigated by the installation of culverts at regular intervals along the roads and the installation of drift fences towards the culverts, although these methods may not eliminate the mortalities among migrating animals, they should greatly reduce the number of animals killed on roads; and
- » A low speed limit can be strictly enforced in order to reduce collisions with animals on the roads during construction phase.

Cumulative impacts:

The significance of cumulative impacts are considered to be of low significance due to other infrastructure in the area, permanent in duration and confined to the site only.

Residual impacts:

None.

Construction Impact 6: Potential impacts due to increased prevalence of exotic invasive species

Nature: Desert and semi-desert areas are very susceptible to invasion by exotic species due to the slow growth rate of indigenous vegetation due to low rainfall and this impact needs to be monitored and mitigated. Areas of high conservation importance and/or ecological integrity should be avoided. Invasive species currently present in the study area are: <i>Opuntia ficus-indica</i> , <i>Argemone mexicana</i> , <i>Datura stramonium</i> , <i>Agave Americana</i> and <i>Prosopis glandulosa</i> ,		
	Without mitigation	With mitigation
Extent	Local (2)	Site Only (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Definite (5)	Improbable (2)
Significance	High (65)	Low (20)
Status	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources	Yes	Yes
Can impacts be mitigated	Yes	
Mitigation: An exotic/invasive species monitoring and management plan should be put in place to manage invasions and control exotic and invasive species during routine maintenance of the road reserve.		
Cumulative impacts: The significance of cumulative impacts are considered to be of low significance, permanent in duration and confined to the study area only.		
Residual impacts: None.		

Construction Impact 7: Potential increase in soil erosion

Nature: Increased erosion can eventually lead to the loss of vegetation and habitats for fauna species. Soils in the area are prone to erosion in areas where vegetation is cleared, this is further compounded by the fact that precipitation in the area occurs through heavy rainfall events in the form of thundershowers in summer.		
	Without mitigation	With mitigation
Extent	Local (2)	Site Only (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Definite (5)	Improbable (2)
Significance	High (65)	Low (20)
Status	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources	Yes	Yes
Can impacts be mitigated	Yes	
Mitigation: » An erosion monitoring and mitigation plan should be put in place to help with the early detection of erosion and advising management on problem areas and remediation plans;		

and » The management of stormwater to prevent large volumes of high energy water flowing along or off the road.
Cumulative impacts: The significance of cumulative impacts are considered to be of low significance, permanent in duration and confined to the site only.
Residual impacts: None.

1.2. Operation Phase / Maintenance

The road will be maintained by the Northern Cape Department of Roads and Public Works (NC DR&PW). Due to the fact that the section of road constructed will be replacing an existing road, with associated impacts, it is unlikely that any additional impacts will be result. The only possible impacts associated with the road during the operation phase may be due to road maintenance, and these will need to be addressed by the NC DR&PW before such maintenance is implemented.

1.3. Conclusion

The majority of the realignment occurs within an area of moderate ecological sensitivity. Areas of moderate and low ecological sensitivity within Portion 4 of Farm Scuitklip 92 refer to areas where a great amount of disturbance has already occurred and species of concern are less likely to be present. Areas that have been severely disturbed are considered of low conservation importance. These areas are, however, quite small in relation to the overall study area (>5% of the study area). The natural areas are considered of very high conservation importance due to the presence of Red Data species in these areas and the intrinsic importance of these areas. In keeping with the Precautionary Principle, a higher conservation importance is assumed when in doubt.

Areas that have been disturbed by farming are considered to be of moderate ecological sensitivity. Ecological integrity and -conservation importance of the areas that will be affected by the clearing of vegetation are low to moderate, however species of concern (such as *Hoodia gordonii* and *Boscia foetida*) may be impacted upon. . *Boscia foetida* have been identified within the assessment corridor, while *Hoodia gordonii* have not been identified. However, *Hoodia gordonii* is not a large conspicuous species and the likelihood that isolated species or colonies occurring in the area can be high.

An ephemeral drainage line (wash) bisects the northern section of the study area from east to west, gradually narrowing towards the east. This system is highly fragmented by the roads and farming practices in the past while the adjacent projects have now disrupted any flows within this system (Scherman Colloty & Associates, 2016). Therefore, the drainage line is considered to be of low significance.

Although the realignment is situated within an ESA which is listed as a migration route, the migration route does seem to be counter-intuitive as it seems to start in the lowlands of the Gariiep River, crosses over rocky mountainous areas only to return to the lowlands of the Gariiep River lowlands again. Regardless, the realignment of the MN73 will not impact the migration route and would have very little impact on species using this route.

The impacts on vegetation and fauna within the proposed footprint is likely to be relatively low with the implementation of mitigation measures. Given the small footprint of the realignment, the construction of the road within the 40m corridor would not generate any impact of high negative significance, providing that mitigation measures are implemented. As a result, there do not appear to be any reasons to oppose the realignment of the MN73. Impacts identified are related to both the development footprint of the Paulputs CSP Facility and the 40m assessment corridor for the road realignment.

2. Assessment of Potential Impacts on Drainage Systems

Portion 4 of the Farm Scuitklip 92 itself is mostly dry, although a number of drainage lines and some alluvial watercourses were observed. Only one of these ephemeral drainage line (wash) occur within the proposed 40m assessment corridor from east to west, gradually narrowing towards the east³. This ephemeral drainage line is regarded as a wash, as water will only flow after good rains, and soon dry up again. This system in particular was highly fragmented by the roads and farming practices in the past while the adjacent projects (i.e. Kaxu Solar One and Xina Solar One) have now disrupted any flows within this system (Scherman Colloty and Associates, 2016)⁴. Impacts identified are related to both the development footprint of the Paulputs CSP Facility and the 40m assessment corridor for the road realignment.

2.1. Construction Phase

This phase assesses the impacts associated with Portion 4 of the Farm Scuitklip 92 and the 40m assessment corridor for the MN73 realignment. Impacts on the physical environment has been assessed and considers both the Paulputs CSP Facility and the road realignment (refer to Final Environmental Impact Assessment Report: Paulputs CSP Project near Pofadder, Northern Cape Province (2016)).

Impact of the physical environment: Impact on localised drainage systems

Nature: The physical removal of narrow strips of woody riparian zones being replaced by hard

³Hudson, A. 2017. Ecological Baseline And Impact Assessment Report for the proposed realignment of the MN73 Road near Pofadder, Northern Cape Province. Hudson Ecology.

⁴ Scherman Colloty and Associates. 2012. Water Resources Assessment: Paulputs Concentrated Solar Plant, Northern Cape Province.

engineered surfaces will alter the hydrological nature of the area, by increasing the surface run-off velocities, while reducing the potential for any run-off to infiltrate the soils. This impact would however be localised, as a large portion of the remaining farm and the downstream catchment would remain intact.		
	<i>Without mitigation</i>	<i>With mitigation</i>
<i>Extent</i>	Site Only (1)	Site Only (1)
<i>Duration</i>	Long-term (4)	Long-term (4)
<i>Magnitude</i>	Low (4)	Low (4)
<i>Probability</i>	Definite (5)	Probable (3)
<i>Significance</i>	Medium (45)	Low (24)
<i>Status</i>	Negative	Negative
<i>Reversibility</i>	High	High
<i>Irreplaceable loss of resources</i>	No	No
<i>Can impacts be mitigated</i>	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Any stormwater within the 40m assessment corridor must be handled in a suitable manner, i.e. install stilling basins to capture large volumes of run-off, trap sediments and reduce flow velocities. » The realignment of a section of the MN73 will require a water use license in terms of section 40 and section 21 (c) and (i) of the National Water Act (Act 36 of 1998) and an application will be submitted to DWS for approval prior to the commencement of the construction phase. » A Stormwater Management Plan for a bridge structure over the watercourse should be compiled as part of the WULA prior to the commencement of the construction phase of the development. 		
Cumulative impacts:		
The increase in surface run-off velocities and the reduction in the potential for groundwater infiltration is unlikely to occur, considering that the site is not near the main drainage channel and the annual rainfall figures are low.		
Residual impacts:		
Diversion of run-off away from downstream systems is unlikely to occur as the site is not near the main drainage channel and the annual rainfall figures are low.		

2.2. Operation Phase / Maintenance

The road will be maintained by the Northern Cape Department of Roads and Public Works (NC DR&PW). Due to the fact that the section of road constructed will be replacing an existing road, with associated impacts, it is unlikely that any additional impacts will be result. The only possible impacts associated with the road during the operation phase may be due to road maintenance, and these will need to be addressed by the NC DR&PW before such maintenance is implemented.

2.3. Conclusion

Only one watercourse occur within the proposed 40m assessment corridor. This system was highly fragmented by the roads and farming practices in the past while the adjacent

projects have now disrupted any flows within these systems. **The significance of this impact at the time of assessing the adjacent projects was low, due to the impacts and high degree of fragmentation coupled to the general lack of any important/visible aquatic habitat** (Scherman Colloty and Associates, 2016). Therefore the drainage line that is traversed by the 40m assessment corridor is considered to be of low significance. No fatal flaws are associated with the road realignment within the identified corridor. All impacts that may to occur project can be mitigated to an acceptable level.

3. Assessment of Potential Impacts on Heritage Sites

The environment is arid, comprising relatively flat drainage plains with dunes situated in the western portion of the project site and several outcropping rocky features in the north eastern part of the project site and a 60m buffer has been taken into account around these rocky outcrops. The landscape is sparsely vegetated, hence any surface archaeological traces are likely to be highly visible. The site assessment was undertaken for the full extent of Portion 4 of the Farm Scuitklip 92. Impacts identified are related to both the development footprint of the Paulputs CSP Facility and the corridor for the road realignment.

Archaeological traces

The rocky outcrops and hills all had some trace of human activity from Stone Age to colonial times, with (from the Later Stone Age) small scatters of ostrich eggshell, quartz flakes and an upper grindstone adjacent to a bedrock grinding surface; a large core (Earlier Stone Age); and two instances of rectangular dry-packed stone walling (colonial).

The sandy plains were found to have zero to extremely low density occurrences of Stone Age material, found in the form of isolated instances of ostrich eggshell pieces, widely scattered isolated quartz flakes, predominantly of Later Stone Age character, and three completely isolated Earlier Stone Age pieces, namely a core and two handaxes, kilometres apart. **Figure 3.1** illustrates the distribution of scattered artefacts in relation to the 40m assessment corridor.

Colonial to recent

Graves/memorials of the colonial era might exist. Several memorial markers were identified within Portion 4 of the Farm Scuitklip 92.

Palaeontological features

A desktop Palaeontological Impact Assessment (PIA) of the full extent of Portion 4 of the Farm Scuitklip 92 has previously been undertaken by John Pether in 2010⁵. The section

⁵ Pether, J. 2010. Brief Palaeontological Impact Assessment (Desktop Study). Proposed Pofadder Solar Thermal Plant. Portion 4 of the Farm Scuit-Klip 92, Kenhardt District, Northern Cape. 3 December 2010.

of the MN73 road realignment entails shallow disturbance of superficial, geologically young (Quaternary) deposits which have low palaeontological potential and sensitivity and very few fossils have been found in this context.



Figure 3.1: Distribution of scattered artefacts in relation to the road realignment 40m assessment corridor.

3.1. Construction Phase

Portion 4 of the Farm Scuitklip 92 has been assessed by the heritage specialist. Several heritage sites have been identified along the realignment route, but none within the 40m corridor. With respect to impacts to heritage resources, the potential for impacts are considered to be most severe during the construction phase. In the long term, the proximity of operations in a given area could result in secondary indirect impacts resulting from the movement of people or vehicles in the immediate or surrounding vicinity.

Construction Impact 1: Potential Impacts on heritage sites

Nature: Activities resulting in disturbance of surfaces and/or sub-surfaces containing artefacts (causes) resulting in the destruction, damage, excavation, alteration, removal or collection from

<p>its original position (consequences), of any archaeological material or object (what affected). Construction of the new section of road will include the modification of the landscape surface within a continuous strip.</p> <p>The destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period of the proposed realignment.</p>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Short-term (1)
Magnitude	High (8)	Low (4)
Probability	Improbable (2)	Very improbable (1)
Significance	Low (28)	Low (6)
Status	Negative	Negative
Reversibility	No	No
Irreplaceable loss of resources	<p>Yes, if and where present – but occurrence is between zero and extremely low density, no or low significance. Sensitive areas at and around rocky outcrops have been excluded from the development because of sensitivity. Memorials sites identified are to be treated as areas of high sensitivity and should include a 10m buffer. A 60m buffer around the outcrops has been taken into consideration.</p>	
Can impacts be mitigated	Yes but not considered necessary.	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Artefact densities are zero to extremely low along the road realignment corridor. Unlike biological processes, heritage destruction generally has a once-off permanent impact. The significance of the impact is considered to be of low significance. Mitigation measures are not considered necessary. » A Heritage Monitoring Programme, including a chance find procedure, has been developed and included as Appendix H of the Environmental Management Programme (refer to Appendix G of the Basic Assessment). 		
<p>Cumulative impacts:</p> <p>The significance of cumulative impacts are considered to be of low significance, permanent in duration and confined to the site only.</p>		
<p>Residual impacts:</p> <p>There would be little residual impact after mitigation as a result of the low impacts anticipated.</p>		

3.2. Operation Phase / Maintenance

The road will be maintained by the Northern Cape Department of Roads and Public Works (NC DR&PW).

3.3. Conclusion

Areas of heritage sensitivity on Portion 4 of the Farm Scuitklip 92 include terrain close to hills or rocky features and the memorial sites below Ysterberg. The rocky outcrops that

occur at the north eastern side of the proposed project footprint are regarded as no go areas. The outcrop situated nearest to the 40m road realignment corridor is approximately 1.5km away. A 60m buffer around each outcrop has been considered. These sites and others like them in the broader landscape provided shelter and variety of resources that attracted human activity through the Stone Age.

The memorial sites located below Ysterberg are regarded as high sensitivity and it is recommended that these memorial markers be respected by way of a 10m buffer zone. The closest memorial site is approximately 370m from the 40m corridor. These memorials are completely avoided by the realignment of a section of the MN73 and the 40m assessment corridor. The open plains have been found to have sparsely scattered artefacts. None of these scattered artefacts were identified within the 40m assessment corridor. These memorial sites, rocky features and scattered artefacts have been considered and will not be impacted by the realignment. The overall impact of the proposed Project on heritage sites are considered to be of low significance.

The section of the MN73 road to be realigned entails shallow disturbance of superficial, geologically young (Quaternary) deposits which have low palaeontological potential and sensitivity. Very few fossils have been found in this context in the Northern Cape Province. In view of the low fossil potential within Portion 4 of the Farm Scuitklip 92, field surveys and monitoring of bulk earth works by a specialist are not justified (refer to **Appendix J3**). If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, the SAHRA APM Unit must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit, must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.

The impact on heritage resources is therefore likely to be of **low significance** and no fatal flaws are associated with the road realignment within the identified corridor. All impacts that may occur project can be mitigated to an acceptable level. A Heritage Monitoring Programme including a chance finds procedure has been developed and included as Appendix H of the Environmental Management Programme (refer to **Appendix G** of the Basic Assessment).

4. Assessment of Potential Impacts on the Social Environment

During construction of the realignment, a small number of temporary jobs will be created. Negative impacts associated with the construction relate to nuisance impacts (noise and dust), and traffic. Negative social impacts can be reduced by implementation

of appropriate construction site management measures. In terms of the overall significance of the impacts of the proposed realignment during operation/maintenance, a high positive impact is envisaged.

4.1. Construction Phase

Impacts associated with the construction phase of the road realignment are mostly of a short duration and temporary in nature, but could have long-term effects on the surrounding social environment if not managed appropriately.

Direct employment and skills development

During the realignment of the road a workforce will be needed, hence direct employment will be generated by the project. The local community will benefit as such construction is labour intensive and requires the unskilled labour. Several skilled professionals will be required. The closest towns to the development are Pofadder and Onseepkans and both have a small population. However, the district as a whole has a large economically active population in search of employment opportunities, which has a pool to tap from. The road realignment is likely to create 18 jobs and will therefore be a positive social impact. Approximately 50% the labour force will be available to low-skilled/ semi-skilled workers, such as construction labourers, security staff. Skilled personnel such as site managers, drivers, equipment operators etc. will account for about 30% and the highly skilled individuals, i.e., engineers, project managers, site managers will be 20%.

The local economy will be boost by income that will be injected through wages. Another positive impact is the indirect employment opportunities that will be created through transportation and other services rendered to staff that will reside off site. The workforce will be staying in nearby towns, such as Pofadder and will be transported to and from the site on a daily basis. People in the service industry, such as those who hire out equipment, waste removal, catering and laundry service providers will also benefit during the construction phase.

Construction Impact 1: Potential Impacts on direct temporary employment opportunities and skills development

Nature: The creation of temporary employment opportunities and skills development opportunities during the construction phase for the country and local economy.		
	Without enhancement	With enhancement
Extent	Site only (1)	Local (2)
Duration	Very short duration (1)	Very short duration (1)
Magnitude	Small (0)	Small to Minor (1)
Probability	Probable (3)	Probable (3)
Significance	Low (6)	Low (9)
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources	N/A	

Can impacts be mitigated	Yes
Enhancement:	
<ul style="list-style-type: none"> » Efforts should be made to employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria, where possible; » Establish a 'labour and employment desk'; » It is recommended that local employment policy be adopted to maximise the opportunities made available to the local labour force, especially for semi and low-skilled job categories; » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible; » Develop a community labour agreement with targets for local employment; » It is recommended to set realistic local recruitment targets for the construction phase; and » Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase. 	
Cumulative impacts:	
Opportunity to upgrade and improve skills levels in the area.	
Residual impacts:	
<ul style="list-style-type: none"> » Improved pool of skills and experience in the local area; and » Temporarily employment during construction phase will result in jobs losses and struggles for construction workers to find new employment opportunities. 	

Economic multiplier effects

The KMLM community is likely to experience an increase in income due to a boost in spending. During the project life there will be spending in both local goods and services, which will be beneficial to the local economy. Through expenditure on construction related materials and equipment, accommodation for staff members and transportation services, the local economy will be enhanced though it could be for a short period. Labourers will also greatly contribute to the increase in income through purchase of various consumables.

Construction Impact 2: Economic multiplier effects

Nature: Significance of the impact from the economic multiplier effects from the use of local goods and services.		
	Without enhancement	With enhancement
Extent	Local to Regional (3)	Local to Regional (3)
Duration	Very short (1)	Very short (1)
Magnitude	Small (0)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (12)	Low (18)
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources	N/A	
Can impacts be mitigated	Yes	
Enhancement:		
<ul style="list-style-type: none"> » It is recommended that a local procurement policy be adopted by the developer to maximise the benefit to the local economy; » Where feasible, the developer should create a database of local companies, specifically 		

<p>historically disadvantaged (HD) which qualify as potential service providers (e.g. construction companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors; these companies should be notified of the tender process and invited to bid for project-related work where applicable;</p> <ul style="list-style-type: none"> » It is recommended that goods and services are sourced from the local area as much as possible; engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers, where feasible; and » Efforts need to be employed to enhance indirect local entrepreneurship opportunities by supporting local entrepreneurs as far as possible.
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> » Opportunity for local capital expenditure, potential for the local service sector; and » Opportunity for local entrepreneurs to develop their businesses.
<p>Residual impacts:</p> <ul style="list-style-type: none"> » Improved local service sector, growth in local business » Economic growth for small-scale entrepreneurs

Influx of economic opportunities seekers

The proposed road realignment is likely to create an influx of people seeking economic opportunities. That could result in pressure on economic and social infrastructure. A rise in social conflicts or change in social dynamics could be experienced due to a mixture of different cultures, races and ethnicity groups. The high unemployment rate in the KMLM and expectations of the community created by the mere fact that a development is earmarked for their area is already a source of competition amongst locals. Having outsiders will exacerbate the situation. Influx of economic migrants could also lead to a temporary upsurge in crime and/an increase in unemployment figures due to an oversupply of labour, especially for the low to semi-skilled personnel.

The impact associated with in-migration of jobseeker includes pressure on local services and infrastructure. This includes municipal services such as sanitation, electricity, water, waste management, health facilities, transportation and availability of housing. Informal settlements may develop near towns to accommodate jobseekers. It is very difficult to control the influx of people into an area, especially in a country where there are high levels of unemployment.

Construction Impact 3: Influx from economic opportunity seekers

Nature: Added pressure on economic and social infrastructure and increase in social conflicts during construction as a result of in-migration of economic opportunities seekers.		
	Without mitigation	With mitigation
Extent	Local to Regional (3)	Site only (1)
Duration	Very Short (1)	Very Short (1)
Magnitude	Small to Minor (1)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (15)	Low (12)

Status	Negative	Negative
Reversibility	Yes	N/A
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Local businesses should be given priority. » It is recommended that local employment policy is adopted to maximise the opportunities made available to the local labour force. » This 'locals first' policy should be advertised for construction employment opportunities, especially for semi and low-skilled job categories. Enhance employment opportunities for the immediate local area; Pofadder, Onseepkans and Pella, and if this is not possible, then the broader focus areas should be considered for sourcing workers such as KMLM. » Prior to construction commencing representatives from the local community (e.g. ward councillor, surrounding landowners) should be informed of details of the construction schedule and exact size of the workforce. » Recruitment of temporary workers at the gates of the development should not be allowed. A recruitment office should be established by the contractor in a nearby town to deal with jobseekers. » A security company is to be appointed and appropriate security procedures to be implemented. » Establish procedures for the control and removal of loiters at the construction site. » A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained, by the contractor and monitored by the ECO, to record all complaints and queries relating to the project and the action taken to resolve the issue. 		
Cumulative impacts:		
Cumulative impacts and change to the local economy with an in-migration of labourers and jobseekers to the area will be local, long-term and probable.		
Residual impacts:		
Possibility of outside workers or businesses people remaining in the area after construction is completed and subsequent pressures on local infrastructure and services.		

Nuisance impacts (noise, dust, and wear and tear of roads)

During the road realignment, adjacent properties will be affected by noise from trucks and construction equipment. However, as much as noise levels are audible over a large distance, it tends to be for a short duration. Dust is the biggest concern for the adjacent landowners as the grazing land will be affected. In previous construction activities, people have lost their livestock due to compromised vegetation as a result of excessive dust, and insufficient feedstock being available for the sheep to graze. The potential impacts could be addressed by implementing the relevant mitigating measures. Heavy construction vehicle could also lead to damages to both regional and internal access roads.

Noise, vibrations and pollution from heavy vehicle traffic during the construction phase could cause temporary disruptions in daily living, movement patterns and quality of life for the local community.

Construction Impact 4: Nuisance impacts

Nature: Nuisance impacts in terms of temporary increase in noise and dust, or the wear and tear on access roads to the site.		
	Without mitigation	With mitigation
Extent	Site only (1)	Site only (1)
Duration	Very Short (1)	Very Short (1)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (18)	Low (12)
Status	Negative	Negative
Reversibility	Yes	N/A
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	
Mitigation:		
<ul style="list-style-type: none"> » The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays and holiday periods where feasible; » The contractor must ensure that any damage/wear and tear caused by construction related traffic to the roads utilised are repaired before the completion of the construction phase; » Dust suppression measures must be implemented for heavy vehicles; » All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits; and » Communication, complaints and grievance channels must be implemented and contact details provided to all impacted and adjacent landowners in the study area. 		
Cumulative impacts:		
<ul style="list-style-type: none"> » If damage to roads is not repaired, then this will affect other road users and result in higher maintenance costs for vehicles of road users. » Other construction activities in area will heighten the nuisance impacts, such as noise, dust and wear and tear on roads. 		
Residual impacts:		
Only damage to roads that are not fixed could affect road users.		

Safety and security impacts

An increase in crime is often associated with construction activities. The perceived loss of security during the construction phase of the proposed section of the MN73 to be realigned due to the influx of workers and/or outsiders to the area (as in-migration of newcomers, construction workers or jobseekers are usually associated with an increase in crime), may have indirect effects such as increased safety and security issues for neighbouring properties and damage to property, increase risk of veld fire, stock theft, poaching, crime and so forth. However, construction staff will not be housed on site. Overnight worker presence will be limited to security personnel.

Apart from construction crew that poses a potential increased risk there may also be an influx of people looking for economic opportunities. Safety and security impacts are a reality in South Africa that needs to be addressed through appropriate mitigation measures. Majority of the impacted and adjacent farm owners utilise their farms for livestock farming and crop farming. Hence most of them have indicated a security concern as livestock has been lost in previous years.

Construction Impact 5: Safety and security impacts

Nature: Temporary increase in safety and security concerns associated with the influx of people during the construction phase.		
	Without mitigation	With mitigation
Extent	Site only (1)	Site only (1)
Duration	Very Short (1)	Very Short (1)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Low (18)	Low (12)
Status	Negative	Negative
Reversibility	Yes	N/A
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Employing local community members could minimise the potential for criminal activity or perceived perception of an increase in criminal activity due to the presence of an outside workforce and influx of newcomers into the area; » Working hours should be kept between 6am and 6pm during the construction phase, and/or as any deviation that is approved by the relevant authorities; » The contractor must ensure that open fires on the site for heating, smoking or cooking are not allowed except in designated areas; » Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff; » A comprehensive employee induction programme would cover land access protocols, fire management and road safety. This must be addressed in the construction EMPr as the best practice; » The contractor should have personnel trained in first aid on site to deal with smaller incidents that require medical attention; and » Method of communication should be implemented whereby local landowners can express any complaints or grievances with the construction process. 		
Cumulative impacts:		
Possible increase in crime levels (with influx of people) with subsequent possible economic losses.		
Residual impacts:		
None anticipated.		

Traffic Impacts

The total development traffic for the construction for the road and the CSP facility is dispersed over a wide road network and over a period of three years and is insignificant,

apart from abnormal load vehicles that are not peculiar to the road network and that are subject to a specific permit/approvals process. On occasion, as a worst case scenario, some 21 heavy vehicles might arrive on a day outside of peak hours. This is an insignificant number of vehicles that will be dispersed on the road network. The site staff related traffic will arrive from a number of routes and is dispersed over the wider road network and consequently will have low traffic impact. Low background traffic volumes will be accommodated with ease, both on the road network and at the site accesses.

Construction Impact 6: Traffic impacts

Nature: Temporary increase in traffic, probable traffic disruptions and increased safety risks for road users.		
	Without mitigation	With mitigation
Extent	Site only (1)	Site only (1)
Duration	Very Short (1)	Very Short (1)
Magnitude	Low (4)	Minor to Low (3)
Probability	Probable (3)	Improbable (2)
Significance	Low (18)	Low (10)
Status	Negative	Negative
Reversibility	Yes	N/A
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Construction traffic should be distributed throughout the day, which will minimise the impact on the existing traffic patterns. » Road signs warning of construction vehicle activity needs to be erected for the construction phase; and » Abnormal Load Permits being obtained for transport of abnormal loads as and when required. 		
Cumulative impacts:		
Possible increase in traffic disruptions, increased heavy vehicle traffic and safety risks/hazards for road users.		
Residual impacts:		
None anticipated.		

4.2. Operation Phase / Maintenance

Once the MN73 road is realigned, the Department of Roads and Public Works will maintain the section of road and the road reserve. The Department will be responsible for any operation and maintenance activities of the road. The potential social impacts which could arise as a result of the operation/maintenance of the proposed road realignment include; reduced safety hazards (i.e. glint and glare from heliostat field) and increased benefits for the road users. Maintenance of the road surface will be undertaken by the NC DR&PW and should include fixing of potholes, management of erosion etc.

Operation Impact 1: Safety hazards and increased benefits for the road users

Nature: There will be an increase in safety due to the newly realigned road that does not traverse the heliostat field of the authorised Paulputs CSP Facility, which also decreases the risk of glint and glare and distraction on drivers. The realigned road will also create economic opportunities for the local area.		
	Without enhancement	With enhancement
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Medium (36)	Medium (48)
Status	Positive	Positive
Reversibility	Yes	Yes
Irreplaceable loss of resources	No	
Can impacts be mitigated	No	
Enhancement:		
<ul style="list-style-type: none"> » Cognisance be taken of building lines applicable in terms of Act 21 of 1940; » Engagement and involvement of the local municipality (KMLM) with social responsibility plans; and » Ensure that the real needs of communities are addressed and in line with the local government. 		
Cumulative impacts:		
Reduce safety hazards, increase flow of traffic and strengthening transport linkages.		
Residual impacts:		
None anticipated.		

4.3. Conclusion

From a social perspective it is concluded that the road realignment is supported, but that mitigation measures should be implemented and adhered to. Positive and negative social impacts have been identified. The assessment of the key issues indicated that there are no negative impacts that can be classified as fatal flaws and which are of such significance that they cannot be successfully mitigated. Positive impacts could be enhanced by implementing appropriate enhancement measures and through careful planning.

5. No Go Alternative

This is the option of not realigning the section of the MN73 which traverses Portion 4 of the Farm Scuitklip 92 and the authorised Paulputs CSP facility development footprint.

The current land use of Portion 4 of the Farm Scuitklip 92 includes:

- » Existing KaXu Solar One CSP Facility situated within the southern section of the farm portion (Zoned: Special Solar use);

- » Existing Xina Solar One CSP Facility situated within the southern section of the farm portion (Zoned: Special Solar use);
- » The Paulputs-Scuitdrift 1 132kV and Paulputs-Kaxu Solar 1 132kV power lines traverse the centre of the farm portion (registered Eskom servitude);
- » Paulputs Substation is situated near to the western boundary within Portion 4 of the Farm Scuitklip 92 (Zoned: Light Industrial use);
- » Existing MN73 provincial road traversing the farm portion from south west to north east (within a registered road reserve);
- » Authorised Paulputs CSP Facility situated within the northern section of the farm portion (to be rezoned to Special Solar use).

The remaining extent of the northern section of Portion 4 of the Farm Scuitklip 92 is currently zoned for Agricultural use and will be rezoned to Special Solar use to accommodate the authorised Paulputs CSP Facility. As the road is directly adjacent to the development footprint (i.e. to follow the outside of the heliostat field) of the Paulputs CSP Facility, the remaining section to be rezoned to Special Solar use will include the area where the road realignment is planned.

There is no cultivated agricultural land or any other commercial agricultural activities within the farm portion. Therefore, the no-go alternative is the option of not realigning the section of the MN73 within a farm portion which has already been disturbed by numerous other infrastructure and which will be zoned to Special: Solar Use. The current land uses do not preclude the planned road realignment, predominantly as this is a 4km realignment of an existing road, and not a greenfields development.

Negative impacts associated with the no-go alternative includes:

- » road user safety on a provincial road relating to line of sight;
- » glint and glare caused by the solar energy facilities; and
- » driver distraction.

Therefore, the need and rationale for the road realignment is to ensure road safety for road users within an area which has become a node for solar energy facilities. The negative impacts of the no-go alternative are considered to outweigh the positive impact (that is, maintaining the current alignment of the existing road) of this alternative. **The 'Do nothing' alternative is, therefore, not a preferred alternative.**

SECTION B: ASSESSMENT OF CUMULATIVE IMPACTS

This Basic Assessment includes an assessment of the cumulative impacts associated with the proposed realignment of a section of the MN73 road which will accommodate the authorised Paulputs CSP Facility as well as other solar energy facilities near the Paulputs Substation.

There has been a steady increase in renewable energy developments recently in South Africa as legislation is evolving to facilitate the introduction of Independent Power Producers (IPPs) and renewable energy into the electricity generation mix. The Department of Energy, under the Renewable Energy Independent Power Producer Procurement (REIPPP) Programme, released in 2011 a request for proposals (RFP) to contribute towards Government's renewable energy target and to stimulate the industry in South Africa. The REIPPP Programme has been rolled out in bid windows (rounds) over the past 5 years, in which developers submit proposed renewable energy projects for evaluation and selection. As result of the REIPPP Programme, there has been a steady increase in interest in CSP facility developments in South Africa (largely in areas which have an ample solar resource which includes the Northern Cape Province).

At a local level, the area has become a node for renewable energy projects due to the viability of the solar resource for the area. The Paulputs CSP Facility has been authorised for development. There are at least 4 other solar energy facilities, all of which are preferred bidder projects (refer to **Table 1** below). Of these preferred bidder projects, two Concentrated Solar Power (CSP) facilities and one photovoltaic (PV) facility have already been constructed in this area. These are known as the Kaxu Solar One, Xina Solar One and Konkoonsies I PV plants respectively. Another PV facility (known as Konkoonsies II PV) is to be constructed during 2017, and a third CSP facility (known as the Paulputs CSP project) received an environmental authorisation on 16 November 2016.

Table 1: Other solar projects/developments within 30km from the Paulputs CSP Facility

Project Name	Approximate distance from the Paulputs CSP Project site	Project Status
Konkoonsies II Solar Facility	PV facility located <1km south-west of the development footprint	Preferred Bidder Round 4; construction to commence 2017
Konkoonsies I Solar Facility	PV facility located ~2km south-west of the development footprint	Constructed and operational
Xina Solar One	CSP facility located on Portion 4 of the farm Scuitklip 92 located ~1km south-east of development footprint	Under construction
KaXu Solar One	CSP facility located on Portion 4	Constructed and operational

of the farm Scuitklip 92 located
~1.5km south-east of the
development footprint

Potential cumulative impacts associated with the construction of the CSP facility and the proposed road realignment within the immediate vicinity of the proposed Project are expected to be associated with the following aspects:

Ecology: Since the section of road to be constructed will be replacing an existing road, with associated impacts, it is unlikely that any additional impacts will be resultant. The construction and existence of the new alignment in itself does not imply added impacts. Since the road will be circumventing a new development it may increase the general impacts associated with the CSP facility.

Cumulative impacts on ecological processes considering the proposed road realignment and the Paulputs CSP Facility along with other similar projects in the area are expected to be of medium significance without the implementation of appropriate mitigation measures. Therefore, with mitigation cumulative impacts are expected to be of a lower significance. As a result, there are not expected to be any ecological fatal flaws or impacts that cannot be mitigated that should prevent the development from being approved.

Heritage: In terms of the cumulative impact of the proposed Paulputs CSP Project and other CSP developments in the area, the potential for impact on the heritage landscape is increased slightly. No heritage sites have been identified within the 40m corridor proposed for the realigned road. The contribution of the project to cumulative impacts is expected to be negligible. As a result, there are no fatal flaws or impacts that cannot be mitigated that should prevent the development from being approved.

Social Environment: The Paulputs CSP Facility and proposed realignment of the MN73, along with the establishment of other solar energy facilities has the potential to result in significant positive cumulative impacts; specifically with the creation of a number of socio-economic opportunities for the Province, which in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. Benefits to the local, regional and national economy through employment and procurement of services could be substantial should many renewable energy facilities proceed. Furthermore at municipal level, the cumulative impact could be positive and could incentivise operation and maintenance companies to centralise and expand their activities towards education and training more closely to the projects. The cumulative impacts are likely to have significant positive impact on the local economy.

SECTION C: OVERALL CONCLUSION

The following conclusions regarding the proposed realignment of a section of the MN73 have been made:

Ecology: Short term impacts (vegetation clearing, dust and vibration and noise) are likely to have a short term increase in negative impacts. The longer term impacts are however likely to be negligible in comparison with the current ecological status quo, as these impacts already exist due to the existing road and its associated impacts. Overall the ecological impact is therefore likely to be of low significance and, from an ecological point of view, no fatal flaws are associated with the road realignment within the identified corridor. All impacts that may to occur project can be mitigated to an acceptable level.

Heritage: The destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. From a heritage perspective, the construction of the proposed road realignment are considered acceptable. The impact on heritage resources is therefore likely to be of **low significance** and no fatal flaws are associated with the road realignment within the identified corridor. All impacts that may to occur project can be mitigated to an acceptable level.

Social Impacts: Social impacts are expected during all phases of the development and are expected to be both positive and negative. Positive impacts are expected to be of **low - medium significance**. Negative impacts associated with the road realignment are expected to be of **low significance**. Impacts can be minimised or enhanced through the implementation of the recommended management measures. From a social perspective, the construction of the proposed road realignment is considered acceptable. No fatal flaws are associated with the road realignment within the identified corridor. All impacts that may to occur project can be mitigated to an acceptable level.

Overall conclusion

From the specialist studies undertaken, the route and 40m corridor proposed for the road realignment is considered to be acceptable from an environmental perspective.

Based on the findings of the studies undertaken, in terms of environmental constraints and opportunities identified through the Environmental Basic Assessment process, no environmental fatal flaws were identified to be associated with the construction of the realigned section of the MN73 road. Impacts are expected to be **low** after the implementation of appropriate mitigation and it is recommended that the proposed road realignment be implemented to enhance road user safety. Considering the information

available at this planning stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as acceptable.

It is the conclusion of the Environmental Assessment Practitioner that the realignment of the section of the MN73 is considered acceptable from an environmental perspective and should be authorised, with the implementation of the recommended mitigation measures.